

CORPORATE GOVERNANCE AND FIRM EFFICIENCY IN THE LONG-TERM INSURANCE MARKET IN SOUTH AFRICA

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DEDICATION

I dedicate this dissertation to God, my parents Jonathan and Naomi Boakye and my siblings Darlene, Papa and Nana Boakye.

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ABSTRACT

The financial crises experienced worldwide have contributed to the rising importance of corporate governance. South Africa is unique in that it has strong corporate governance structures and as a result, it would prove useful to assess the effects of these corporate governance structures on critical sectors such as the long-term insurance industry, which is the largest insurance industry in Africa. The objective of this study is to examine the effect of corporate governance mechanisms and firm efficiency in the South African long-term insurance industry using data on 73 long-term insurers from 2007 to 2014 in a two-stage analysis. In the first stage, firm efficiency is estimated using the data envelopment analysis (DEA) bootstrapping technique of Simar and Wilson (2007), which corrects for biases associated with non-parametric techniques. In the second stage analysis, the truncated bootstrapping regression technique is employed to examine the effect of corporate governance on the estimated efficiency scores. The corporate governance variables used were board size, board independence, audit committee size, CEO tenure and audit independence, while controlling for firm size, reinsurance usage and leverage.

The findings indicate that long-term insurers in South Africa operated at approximately 21% of their optimal capacity which suggests high levels of inefficiency in the provision of life insurance services. The results of the second-stage analysis identify board size, non-executive directorship, CEO tenure and audit independence as the significant corporate governance indicators that impact on efficiency over the study period. In addition, firm size, reinsurance usage and leverage were also observed to be significantly related to the estimated efficiency scores.

The findings suggest that non-executive directors are not as effective as expected, which may be due to a myriad of reasons, such as under-representation on sub-committees, a lack of relevant skills, experience or financial expertise. Insurers should use more stringent criteria to screen potential non-executive directors and provide training and regular updates to adequately capacitate the non-executive directors with the necessary skills and knowledge. The positive relationship between CEO tenure and efficiency suggests that frequent CEO rotation is not advisable.

Most of the corporate governance indicators have a negative effect on efficiency, which is not the intended effect. This is an indication that corporate governance measures should not be

enforced on insurers as a ‘one size fits all’ measure, rather, a focus should be placed on corporate governance measures that have the intended impact, such as audit committee independence.

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LIST OF ACRONYMS AND ABBREVIATIONS

B-C	Bias Corrected
CEO	Chief Executive Officer
DEA	Data Envelopment Analysis
DFA	Distribution Free Approach
FSB	Financial Services Board
FSCA	Financial Sector Conduct Authority
FSRB	Financial Sector Regulation Bill
IB	Insurance Bill
IoDSA	Institute of Directors in Southern Africa
KING	King Codes / King Report on Governance
LTIA	Long Term Insurance Act
PA	Prudential Authority
PTE	Pure Technical Efficiency
RDR	Retail Distribution Review
SAM	Solvency, Assessment and Management
SARB	South African Reserve Bank
SE	Scale Efficiency
SFA	Stochastic Frontier Analysis
TE	Technical Efficiency
TCFF	Treating Customers Fairly Framework
UK	United Kingdom

CHAPTER ONE:

INTRODUCTION

1.1 Background to the Study

The 2008 financial crisis experienced by the American financial system had a far-reaching and significant impact not only in America but on the rest of the world, eventually causing a world-wide recession which affected the livelihood of millions of families. Significant sums of money were lost and various firms in the financial services sector went bankrupt. Conyon, Judge and Michael (2011); and Kirkpatrick (2009), attributed some corporate governance failures and weaknesses as a significant contributing factor in triggering the financial crisis. This illustrates the significant role that corporate governance can and does play in the stability of financial systems and warrants further investigation into the mechanisms and effects of corporate governance on various aspects of the financial system.

The increased focus on corporate governance mechanisms developed over time as firms began to separate ownership from control. As firms got larger and larger, management actions needed to be monitored to ensure that management was acting in the best interests of the firm. This came about through law (through the establishment of fiduciary duty) and market forces. Managers were inclined to act in the best interests of the firm for fear of legal ramifications or because of market forces, as poorly managed firms provide poor financial returns. (Farrar, 1999)

Over the years, corporate governance has gained great importance in the corporate sector. Large-scale international financial scandals involving large, successful companies such as Enron, Parmalat, Barings Bank, Bernard L. Madoff Investment Securities LLC and, more recently, African Bank in South Africa, have emphasized the need for a set of rules and guidelines that ethically govern corporations worldwide. Most of these scandals were due to the actions of management and the board of directors.

The main purpose of a business is to maximise profits for the shareholders of the business, and at times directors and management try to do so unethically and/or fraudulently or put their own interests above those of the shareholders. As a result, these rules and guidelines place specific importance on the actions of directors. The rise of 'good' corporate governance

has seen the creation and updating of guidelines such as Sarbanes Oxley, King I, II and III and the UK Corporate Governance Code.

In South Africa, the Companies Act of 1979 gave way to the Companies Act of 2008, which uses an enlightened shareholder approach that places focus on the protection of stakeholder interests, particularly shareholder interests (both minority and majority shareholders). Additionally, the Companies Act of 2008 places certain restrictions on the autonomy of directors and includes stricter repercussions for directors who breach their responsibilities and fiduciary duties (The Companies Act, 2008). In the United States, listed companies must comply with Sarbanes-Oxley, while listed companies in South Africa are required to comply with the King Reports on corporate governance (JSE Limited, 2012).

Good corporate governance is of even greater importance in industries that manage large sums of the public's money, such as the pension fund industry and the insurance industry. The insurance industry in South Africa is heavily regulated by the Financial Services Board (FSB), Short-Term Insurance Act of 1998 (STIA), Long-Term Insurance Act of 1998 (LTIA), Insurance Laws Amendment Act of 2008 and the Companies Act of 2008. Due to the global financial crisis of 2007-2009, in which the insurance industry played a significant role, additional requirements have been added to the insurance industry regulations (Sibindi, 2015). Apart from complying with industry regulations, the South African insurance industry also adheres to the King III Code on governance (Sibindi, 2015).

1.2 Problem Definition

Corporate governance rules and regulations were created with the aim of protecting and promoting the interests of stakeholders, more specifically shareholders. The question that arises is whether corporate governance has any other tangible benefits or positive side effects. Does forcing companies to look after the interests of shareholders help them to meet the main objective of a business, which is to maximise shareholder wealth?

Compliance with corporate governance codes, rules and regulations is an onerous process. Directors are mandated to act in the best interests of the shareholders, by increasing shareholder wealth. Thus, compliance with corporate governance should not have a negative effect on firm efficiency and profitability. If there is a negative relationship between corporate governance and firm efficiency, it would mean that directors are protecting shareholders' rights at the expense of shareholder wealth. Thus, it is important to identify the

existence and extent of the relationship between corporate governance and firm efficiency. This study aims to determine this relationship, from an African perspective, based on the long-term insurance market.

In addition, , the King Code on Corporate Governance is not complied with by all companies in South Africa, particularly unlisted companies. The King Code also allows users to apply the code or explain non-compliance (The Institute of Directors in Southern Africa, 2009). Determining the relationship and the significance of the relationship between corporate governance and firm efficiency may result in an increase in compliance, if the relationship is found to be significant and positive.

Furthermore, effective corporate governance rules and requirements may improve the running of the day-to-day and long-term operations of the business, thereby influencing the performance and efficiency of a business. Therefore, this study focuses on the following questions:

- i. What is the level of efficiency in the production of long-term insurance business in South Africa?
- ii. Does corporate governance have any effect on the efficiency level of firms in the South African long-term insurance industry?

1.3 Research Objectives and Hypotheses

The purpose of this study is to examine the relationship between corporate governance and firm efficiency in the South African long-term insurance sector. The specific objectives include;

- i. To estimate efficiency in the long-term insurance market in South Africa
- ii. To examine the empirical relationship between corporate governance mechanisms and efficiency in the long-term insurance market in South Africa.

The research hypotheses are:

H0: There is no relationship between corporate governance and firm efficiency in the South African long-term insurance industry.

H1: There is a positive relationship between corporate governance and firm efficiency in the South African long-term insurance industry.

1.4 Justification of the Study

The financial sector plays an important role in facilitating economic growth and attracting foreign investment flows. Financial development has a significant positive effect on economic growth, especially in developing countries (Alhassan & Biekpe, 2016). Thus, an efficient and well-developed financial system is especially important for a developing country like South Africa. Furthermore, insurance sector growth and development have been shown to have a significant positive effect on economic growth and savings mobilization in developing countries, with Alhassan and Biekpe (2016) finding a long-term relationship between insurance market activities and economic growth for South Africa. Economic growth is vital for the development and advancement of developing countries, particularly in Africa, whose economies are often characterised by sluggish or non-existent growth. Thus, factors affecting the efficiency, profitability and sustainability of insurance companies are of great importance and warrant detailed research. (Estrada, Park, & Ramayandi, 2010) (Masoud & Hardaker, 2012) (Balago, 2014) (Oke, 2012) (Alhassan & Biekpe, 2016) (Alhassan & Biekpe, 2015)

Most research focusing on corporate governance and efficiency relates to industrial firms, with limited research examining the relationship between efficiency and corporate governance in the insurance market (Huang, Lai, McNamara, & Wang, 2011). Furthermore, most of studies that do investigate the relationship between corporate governance and firm efficiency focus on European, American and Asian countries. There is limited research available on this topic from an African perspective and it must be noted that the governance structures and insurance markets in Africa differ from those in other parts of the world. Thus, a study on the corporate governance/efficiency relationship within an African context would be more relevant for African insurers in determining the most effective corporate governance structures and for investors by assisting them to make investments in firms and sectors that may yield profitable returns. (Ntim, 2013) (Hsu & Petchsakulwong, 2010) (Cremers & Nair, 2005)

Additionally, South Africa is unique in that it has strong corporate governance structures which would consequently prove useful in assessing the effects of the structures on critical sectors, such as the long-term insurance industry. Further research in this area is therefore not only useful to long-term insurance industry managers and regulators, but also to academic discourse and policies in the fields of corporate governance and insurance.

The focus is on South Africa for this study it has the largest insurance market in Africa, with one of the highest insurance penetration rates in the world, particularly in the long-term insurance market. (Alhassan & Biekpe, 2016) (Alhassan & Biekpe, 2015) (KPMG Report, 2014)

In conclusion, determining the effect of corporate governance on firm efficiency in the South African long-term insurance industry may also be beneficial to investors and shareholders in the insurance sector and to assist investors to make better informed and financially beneficial decisions.

1.5 Organisation of the Study

Chapter 1 of this study presented the background of the study and introduced the problem statement, research objectives and hypotheses and justification of the study.

Chapter 2 presents a summary and critical synthesis of the literature and relevant research associated with efficiency and corporate governance, including existing theories and frameworks.

Chapter 3 presents the methodology and procedures used for data collection and analysis.

Chapter 4 contains an analysis of the data and presentation of the results.

Chapter 5 offers a conclusive summary and discussion of the study's findings, policy recommendations and recommendations for future research.

CHAPTER TWO:

LITERATURE REVIEW

2.1 Introduction

This chapter presents an overview of the long-term insurance market in South Africa. It also discusses the corporate governance framework in South Africa as well as the corporate governance theories. Furthermore, the section discusses the approaches in estimation efficiency in insurance markets and reviews the empirical literature on corporate governance and efficiency in insurance markets.

2.2 The Long-term Insurance Industry: South Africa

This section provides an overview of the long-term insurance industry in South Africa, beginning with a discussion on the legislative and regulatory developments in the South African insurance industry, followed by a discussion on the South African insurance market and industry players.

2.2.1 Legislative and Regulatory Developments

The insurance industry in South Africa is heavily regulated by the Financial Services Board (FSB) based on the Short-Term Insurance Act of 1998 (STIA), Long-Term Insurance Act of 1998 (LTIA), Insurance Laws Amendment Act of 2008 (ILAA), Financial Advisory and Intermediary Services Act (FAIS) and the Companies Act of 2008. (Sibindi, 2015)

Due to the 2008 financial crisis, there have been several regulatory reforms in the South African insurance industry, aimed at ensuring the financial stability of the insurance industry. The reforms are based on the Twin Peaks model; with the ‘twin peaks’ being financial stability and enhanced market conduct regulations (Sibindi, 2015).

The Twin Peaks system was proposed to further regulate the industry on improving financial sector stability and protection of customers and is based on the 2011 government policy paper, ‘A safer financial sector to serve South Africa better’, which identified weaknesses in the South African financial sector based on lessons learnt from the 2008 financial crisis. An additional factor for the introduction of the Twin Peaks system is the fragmented nature of financial sector regulations, for each individual industry. The Twin Peaks system will aim to create comprehensive regulations that bring together all the various industry regulations to create overarching and comprehensive oversight of the financial sector. Currently, the

Financial Services Board (FSB) oversees the insurance industry which, under the proposed Twin Peaks system will cease to exist, and be replaced by two new authorities, the Financial Sector Conduct Authority (FSCA) and the Prudential Authority (PA). The FSCA will act as an independent entity while the PA will operate as part of the South African Reserve Bank (SARB), which will have financial stability oversight (National Treasury, 2014).

The Financial Sector Regulation Bill (FSRB), the Insurance Bill of 2016, the Retail Distribution Review (RDR), Treating Customers Fairly Framework (TCFF) and Solvency, Assessment and Management (SAM) have been the most significant developments in the insurance industry.

i. The Financial Sector Regulation Bill (FSRB)

The main purpose of the FSRB is to provide the framework and processes required to enforce the Twin Peaks system. Apart from creating the two new regulatory authorities, the FSCA and PA, the FSRB identifies the objectives, responsibilities and powers of these two authorities over the financial sector and the phases and time periods during which these changes will take place. (National Treasury, 2014).

In the early stages of the implementation of the FSRB, the current insurance industry regulations, such as the LTIA, will remain in place but oversight of these regulations will move from the FSB to the new regulatory authorities, the FSCA and PA. In the later stages of the implementation of the FSRB, some of the current insurance industry regulations relating to market conduct will be replaced by more comprehensive non-industry-specific regulations. Additionally, under the FSRB, the PA and FSCA may issue new standards governing the entire financial sector as they see fit. The FSRB views the different industries that constitute the South African financial sector as extremely interconnected. As a result, the PA, FSCA, SARB and the National Credit Regulator (NCR) will not function wholly independently of each other but as interconnecting, collaborative and co-operative units. (National Treasury, 2014)

The Prudential Authority will be mandated with prudential oversight, to improve the safety and soundness of financial institutions with two goals:

- Protecting customers (in the case of insurers, policyholders) against the risk of South African financial institutions being unable to discharge their obligations
- Maintaining financial stability in the financial sector

The Financial Sector Conduct Authority will be mandated to protect financial customers with three goals:

- Ensuring fair treatment of financial customers
- Improving financial system integrity and efficiency
- Improving customer financial literacy through the provision of financial education programmes

ii. The Insurance Bill (2016) (IB)

The objective of the Insurance Bill is to provide a framework for the supervision of the South African insurance industry that is consistent with international standards and best practice. Furthermore, the Insurance Bill replaces the parts of the current LTIA and STIA relating to prudential supervision. The bill, tabled in parliament in January 2016, forms part of the Twin Peaks system and is complementary to the FSRB. The Insurance Bill includes a chapter on governance, which requires an insurer to implement an effective governance framework that protects the interests of policyholders. The governance framework requires the appointment of an auditor and an audit committee consisting of independent industry experts. The Insurance Bill is linked to the Companies Act of 2008 and borrows key aspects of the King Reports (Minister of Finance, 2016).

The framework aims to:

- Lower barriers to entry into the South African insurance industry, encouraging increased participation and competition
- Improve consumer protection
- Improve the supervision and integrity of the South African insurance industry
- Promote the formation of regulated and well-capitalised insurers (Minister of Finance, 2016)

iii. Treating Customers Fairly Framework (TCFF)

The Treating Customers Fairly Framework was drafted by the FSB in response to the publication of 'A Safer Financial Sector to Serve South Africa Better' by the Department of National Treasury and focuses on consumer protection and market conduct. As a key part of the Twin Peaks system, the TCFF will serve as the main framework for the fair treatment of

financial services customers. The TCFF was created in response to the need for a comprehensive, overarching and consistent consumer regulation framework for the financial sector, addressing the information asymmetry between consumers and firms and the unique risks inherent in financial products and services. The TCFF has no formal start date and will instead be gradually implemented, with the expectation that financial sector firms should currently be applying some of the main principles of the TCFF. (Financial Services Board, 2014)

The TCFF involves 6 outcomes:

1. Culture and Governance: The TCFF must be a central part of the firm's governance and risk management frameworks and corporate culture
2. Product Design: The design of products must meet the needs of specific groups of customers and must accordingly be marketed to those specific groups
3. Disclosure: All necessary and relevant information must be timeously and clearly disclosed to customers at all times
4. Suitable advice: Appropriate, fair and customer-specific financial advice must be provided to customers
5. Performance expectations and service: Services received must be of an internationally acceptable standard and must be consistent with advertisements or claims made by the firm to the customer
6. Claims, complaints and switches: Customers should not face unreasonable difficulties in switching between products and firms, laying complaints and submitting claims (Financial Services Board, 2014)

iv. Retail Distribution Review (RDR)

In 2014, the FSB published the Retail Distribution Review, which proposes substantial changes to the regulatory framework for the distribution of financial products to financial customers. The RDR takes direction from the Treating Customers Fairly framework. The RDR proposes a 'consistent approach to the distribution of investment products in the insurance sector' and retirement savings products. The RDR promotes and supports the provision of appropriate and fair financial advice to financial customers; fair long-term customer outcomes; customer financial education and knowledge; and, fair and reasonable prices for financial advice and intermediary services (Financial Services Board, 2014).

v. *Solvency, Assessment and Management (SAM)*

The purpose of the Solvency, Assessment and Management Project is to provide a regulatory framework for the insurance industry. The project was undertaken by the Financial Services Board with input from the South African Insurance industry and is also a result of the Twin Peaks reforms. The SAM framework will largely be enacted through the Insurance Bill, and supported by additional legislation, such as the ‘Governance and Risk Management Framework for Insurers’ (GRMFI), which has been effective since 1 April 2015.

The Governance and Risk Management Framework for Insurers contains requirements for insurance relating to governance and risk, such as the composition of the board of directors; roles and responsibilities of directors; board of directors’ sub-committees; risk management systems; and, internal controls. The SAM framework also aims to improve risk management within the South African insurance industry. (Financial Services Board, 2015)

The SAM framework consists of:

- Governance and Risk Management: This is mostly covered by the Governance and Risk Management Framework for Insurers but will also include risk appetite requirements, requirements for the head of actuarial control and ORSA requirements.
 - Financial Soundness Requirements: This covers group solvency calculations and requirements; valuation of insurance participations; credit risk parameters; contract boundaries for reinsurers; and, the calculation of operational risk, amongst others.
 - Reporting Requirements: This provides reporting templates to be used for insurers, and forms to be used for Insurance Act applications, notifications and exemptions.
- (Financial Services Board, 2015)

Due to the significant changes that the SAM framework brings to the insurance industry, the implementation period is protracted to provide sufficient time for insurers to fully comply with the new regulations. A trial compliance run, named the Comprehensive Parallel Run, occurred in 2015, whereby insurers provided reports based on the financial soundness requirements using the SAM reporting templates and requirements. The FSB itself has also undergone various training programmes to better equip the board in regulating the insurance industry under the SAM framework. The SAM framework has an implementation date of 1 January 2017. (Financial Services Board, 2015).

2.2.2 Stylized Facts: The Long-term Insurance Market

The South African insurance industry is clearly in a major transition phase, which will have significant impact on the state of the insurance industry. These changes will result in a more stable and efficient industry, bringing the South African insurance industry in line with international standards and best practice, which is of great importance in the aftermath of the 2008 financial crisis. The recent regulatory and legislative developments place significant emphasis on risk management, governance and consumer/stakeholder protection, which are also the cornerstones of the King Reports and the Companies Act of 2008, and which insurers are expected to comply with. (KPMG, 2014) (Financial Services Board, 2014)

The South African long-term insurance market has experienced significant growth in recent years, experiencing growth of 19.7% in 2013 and 14.5% in 2014. The South African long-term insurance industry is expected to grow from a total value of \$51.2 billion in 2014 to \$85.6 billion in 2019, representing growth of 67%. (KPMG Report, 2014) (KPMG, 2014)

2.2.2.1 Industry Players

The total number of long-term insurers in the South African market has not varied significantly during the 2007 to 2014 period, as shown in Table 2.1. The number of primary insurers and reinsurers remained relatively unchanged, with 72 primary insurers and 6 reinsurers in 2007 increasing to only 73 primary insurers and 7 reinsurers in 2014. It can be argued that the increased complexity and extent of regulatory requirements may create a barrier to entry for potential market entrants, as they may balk at the administration and costs of compliance, and the costs of non-compliance through sanctions and fines. (KPMG, 2014).

Table 2.1: Firms in the Life Insurance Market (2007-2014)

	Primary Insurers	Reinsurers	Total
2007	72	6	78
2008	76	6	82
2009	78	7	85
2010	80	7	87
2011	80	7	87
2012	79	7	86
2013	74	7	81
2014	73	7	80

Source: Extracts from FSB Annual Reports 2007 to 2014

2.2.2.2 Classes of Policies

Firms in the long-term market are registered to underwrite six different classes of policies in assistance, life, disability, health, fund and sinking fund. Table 2.2 presents the premium distribution across the six classes of policies from 2007 to 2014.

The premium distribution is focused on life and fund policies. Life insurance and funds constituted 94% of the premium distribution in 2007, decreasing slightly to 92% in 2014. Although it is not a legal requirement for home loan applicants to take out life insurance, most South African banks require applicants to have life insurance as a condition of the home loan agreement. In 2011, 9 million South Africans were homeowners, with 13% of those homes not yet paid off. As more and more South Africans enter the housing market, the distribution of life insurance premiums may increase, as evidenced by the slight increase from 2007 to 2017, while fund premiums decreased from 48% in 2007 to 45% in 2014. (Stats SA, 2012)

Various regulations exist to separate health insurance policies from the medical scheme industry, to prevent direct competition between these insurers and medical schemes, as medical schemes are non-profit organisations while insurers are profit-seeking. In 2013, only 18.4% of South Africans was on medical aid, mainly due to a lack of affordability. Thus, health insurance products are affordable to the small percentage of the South African population who already have medical aid. This appears to explain the low percentage of premiums attributed to health insurance policies. (KPMG, 2014) (Stats SA, 2014).

Table 2.2: Distribution of Premiums across Classes of Policy (2007-2014)

	2007	2008	2009	2010	2011	2012	2013	2014
Assistance	1.4%	1.5%	1.4%	1.8%	1.8%	1.7%	1.8%	1.7%
Life	45.9%	44.0%	38.5%	45.7%	46.8%	46.2%	46.8%	46.7%
Disability	1.3%	1.3%	1.4%	1.7%	1.8%	1.7%	2.0%	1.9%
Health	1.0%	0.7%	0.7%	1.2%	1.1%	1.2%	1.0%	1.1%
Fund	48.4%	51.1%	55.5%	46.8%	45.3%	46.9%	45.3%	44.9%
Sinking Fund	2.0%	1.4%	2.5%	2.7%	3.2%	2.4%	3.2%	3.2%

Source: Extracts from FSB Annual Reports 2007 to 2014

The long-term insurance sector comprises life insurance (65.4%) and pensions/annuities (34.6%). The sector is characterised by high competition and rivalry, with 38.9% of the market controlled by four large insurers; Old Mutual Life Assurance Company, Sanlam Life

Insurance Limited, MMI Holdings and Liberty Group Limited and the remaining 61.1% controlled by a variety of other firms. (MarketLine, 2015)

2.2.2.3 Classes of Business

Table 2.3 presents the net premium distribution across the various classes of business of the long-term insurance industry in South Africa. Investments account for most of the premiums in the industry, with a minimal decrease of 3% from 65% in 2011 to 62% in 2014. Risks, being the second largest business class, accounts for 19% of premiums over the 2011–2014 period. Annuities and Universal Life account for the remaining premiums, with a gradual increase from 12% to 16% over the 2011–2014 period for annuities, while universal life decreased by 2% during the period under review. The growth in annuities appears to come from the decline in investments.

Table 2.3: Distribution of Premiums across Classes of Business (2011-2014)

	2011	2012	2013	2014
Investments	65%	65%	64%	62%
Risks	18%	19%	19%	19%
Annuities	12%	12%	14%	16%
Universal Life	5%	4%	4%	3%

Source: Extracts from FSB Annual Reports 2011 to 2014

2.2.2.4 Financial Performance

Table 2.4 presents the financial performance of South African long-term insurers. Firms in the long-term market have experienced notable growth in premiums over the 2007–2014 period, with an average annual growth of 9%. Premium growth peaked in 2008, 2013 and 2014 at 17%, 14% and 15% respectively. Total income increased significantly between 2007 and 2013, showing a 66% increase driven equally by an increase in net premiums and investment income.

The growth in income is extremely positive considering South Africa’s sluggish growth in recent years. It would be expected that as consumers’ disposable income decreases, their ability and/or willingness to pay for insurance may decrease, resulting in lower premium income due to lapsed or cancelled policies. Although the long-term insurance market has experienced this, it has been mainly in the low-end premiums, thus there has been limited effect on insurers’ income. Total income would be expected to continue to increase, as the industry still has significant potential for growth, with only 16% of South African adults

having life insurance in 2013, increasing from 12% in 2012. (World Bank, 2017) (KPMG Report, 2014) (KPMG, 2014) (FinMark Trust, 2013)

Table 2.4: Financial Performance: Incomes and Expenses (2007-2014)

	2007	2008	2009	2010	2011	2012	2013	2014
Income								
Net Premiums	225634	264363	294873	262351	283242	324617	373687	411532
Investment income	178208	13397	78894	189173	133626	239126	290927	283834
Other income	8349	8810	9774	10431	12367	16135	21 690	19948
Total	412191	286570	383541	461955	429235	579878	686304	715314
Expenditure								
Benefits	228320	262891	278643	242297	236145	274464	324485	355801
Management expenses	19247	21201	24581	27314	25886	29252	32222	31933
Commission	10829	11363	11776	12503	14332	16296	18489	19337
Other expenses	6801	2713	15986	3660	8375	7387	10895	8344
Total	265197	298168	330986	285774	284738	327399	386091	415414
Excess income over expenditure	146994	-11598	52555	176181	144497	252479	300213	299900

Source: Extracts from FSB Annual Reports 2007 to 2014

2.3 The Corporate Governance Framework in South Africa

The corporate governance theories represent the cornerstone of corporate governance, as corporate governance frameworks aim to protect the interests of all stakeholders and minimise principal-agent problems and issues of moral hazard. The corporate governance structure of South African firms is regulated by the King I, II and III Reports as well as the Companies Act of 2008, which aims to minimise or eliminate agency costs by aligning the interests of managers with those of stakeholders, through punitive measures, methods of encouragement or policies and regulations.

The King Reports on Corporate Governance, which represent South Africa's corporate governance framework, have undergone three phases. The King Reports embrace the stakeholder theory and indicate minimum standards of good corporate governance based on seven characteristics: discipline, transparency, independence, accountability, responsibility, fairness and social responsibility. These corporate governance mechanisms, by decreasing agency costs and promoting the interests of stakeholders, would be expected to maximise shareholder wealth. (The Institute of Directors in Southern Africa, 2009) (Ryan & Vaugn, 2006)

The Institute of Directors in Southern Africa (IoDSA) published the King I Report on Corporate Governance on 29 November 1994. This first report was internationally recognised as the most comprehensive and inclusive approach to corporate governance available at that time. King I proposed an integrated approach to corporate governance that accounted for the needs of all stakeholders. The first King Report focused on the need for a good system of corporate governance in companies where ownership and management were separate. The report defines a good corporate governance system as one which attempts to meet the needs of different stakeholder groups, while still ensuring that the best interests of the company and its shareholders are prioritised. In preparing the King Report, the King Committee looked at the findings of the United Kingdom Cadbury Committee, which reported on corporate governance mechanisms in 1992. The King Report went further than the Cadbury Committee report by including a Code of Ethical Practice and looking at corporate governance from a South African perspective (e.g. shortage of adequately qualified/skilled directors and affirmative action). King I addressed five critical areas of corporate governance, being directors, audit, stakeholder links, ethics and compliance. These areas covered the functions and responsibilities of directors, the role and appointment of external and internal auditors, ethical business practices and firms' compliance with the report, amongst other things. A significant difference between King I and the later King reports is the focus on listed companies and public entities, with the later King Reports widening the applicability of the report to a wider variety of companies. (Institute of Directors of Southern Africa, 1994) (Institute of Directors of Southern Africa, 2002)

The King II Report on Corporate Governance came into effect on 1 March 2002 and served as an improved and updated version of King I. The most significant aspect of King II was the move from single, bottom-line reporting (profit-focused reporting) to triple bottom-line reporting, which looks at the economic, social and environmental aspects of a company's activities. The King II Report was applicable only to JSE listed companies, banks, financial and insurance entities and certain public-sector enterprises. (Institute of Directors of Southern Africa, 2002)

The third report on corporate governance, King III, represented an important change for corporate governance in South Africa, because of the Companies Act of 2008. The King III Report was released in September 2009 and became effective on 1 March 2010. The King III Report considers the Companies Act of 2008, which became effective on 1 May 2011. The

Companies Act makes certain governance mechanisms legally compulsory, with failure to comply having legal ramifications for a business. The King Reports are based on a 'comply or explain' approach, but due to the requirements of the Companies Act, the King III Report also indicates governance elements and principles that must be complied with, as non-compliance with areas covered by the Companies Act can no longer simply be explained away. (The Institute of Directors in Southern Africa, 2009)

Furthermore, the King III Report also covers areas that were not previously covered by King II:

- IT governance: The prevalence of e-commerce, online trading and electronic communication poses significant risks for businesses and should therefore be adequately managed and controlled through adequate risk management and governance mechanisms.
- Business rescue: Before the Companies Act of 2008, South Africa's legislation did not focus on the rescue of businesses in financial difficulties but rather placed much focus on their liquidation. The Companies Act of 2008 acknowledges the contributions that businesses make to the South African economy and, as a result, companies in financial difficulties that are still economically viable should first go through a business rescue process before considering liquidation. King III requires the board of directors to be aware of and conversant in business rescue legislation, processes and requirements.
- Fundamental and affected transactions: The previous King Reports did not discuss fundamental and affected transactions. However, fundamental and affected transactions are now covered in detail in the Companies Act. Thus, King III includes a section that covers mergers, amalgamations and acquisitions, as directors need to be aware of these requirements in order to adequately discharge their duties.
- Applicability to all businesses: Unlike the previous reports, the King III Report applies to all companies in the public, private and non-profit sectors.
- Integrated Reporting: The King III Report places greater emphasis on integrated reporting and now includes integrated reporting as part of the financial reporting of the business, as they had previously been viewed as separate areas. (The Institute of Directors in Southern Africa, 2009)

The King IV Report on Corporate Governance was released on 1 November 2016 but is only expected to take effect during the latter part of 2017. King IV aims to simplify the interpretation of the King Reports in order to make them more useful and applicable for non-profit organisations, private companies and public-sector entities. The most significant difference between the King III and IV Reports is that the King IV Report is expected to be more of an inclusive and collaborative effort, considering the needs of all the users of the reports, and not just those of listed companies. Consequently, the King IV Report will focus on principles and will clearly differentiate between principles and practice recommendations, as most of the practice recommendations are more suited for listed companies while the principles espoused by the practice recommendations can be applied by all types of businesses. (Institute of Directors Southern Africa, 2016)

A discussion on two important aspects of corporate governance (and the King Reports) follows:

i. Board Composition

Board composition represents an important component of corporate governance. The King Report and Fama and Jensen (1983) state that effective boards should be composed mainly of external, independent directors. Additionally, the positions of Chief Executive Officer (CEO) and Chairman should be held by two separate individuals, with the position of chairman being held by an independent director. This prevents the CEO from dominating the board and minimises the principal-agent problem, as the independent directors have no other incentive but to act in the interests of the shareholders. (The Institute of Directors in Southern Africa, 2009)

ii. Audit Committees

The King Reports and the Companies Act of 2008 place great importance on the size and composition of audit committees. Audit committees provide significant assistance to the board of directors in discharging its responsibilities and have oversight over financial reporting, risk management and regulatory compliance. An audit committee consisting of appropriately qualified directors would be expected to improve the effectiveness of the committee. (The Institute of Directors in Southern Africa, 2009) (The Companies Act, 2008)

2.4 Corporate Governance Theories

Shareholder Theory

Shareholder theory states that the only role of management is to serve the interests of the shareholders. Thus, all resources must be utilised to effectively maximise shareholder wealth. Based on this theory, the interests of other stakeholders should be of no importance, and other stakeholders may receive benefit inadvertently because of shareholder wealth maximisation. (Heath & Norman, 2004) (Hendry, 2001)

Agency Theory

An agency relationship arises between two parties when one party (agent) is designated to act on behalf of the other party (principal), with significant decision-making authority being delegated to the agent. Agency relationships are usually contractual, with a common agency relationship being one between employer and employee. Agency theory in relation to corporate governance addresses the problems caused by the agency relationship, such as the principal – agent problem and moral hazard. In business, the principal – agent problem often refers to the relationship between shareholders (principal) and company directors and managers (agents). Company directors and managers are expected to act in the best interests of shareholders, by maximising shareholder wealth. However, it is often found that company executives tend to act in their own best interests, often to the detriment of shareholders and other stakeholders. If the interests of the executives and shareholders are not aligned, the actions in the interests of the executives may negatively affect shareholder wealth and value, which is often the case. This difference between the agent's decisions and decisions that maximise shareholder wealth results in a residual loss, that can often be quantified, called agency costs. Moral hazard arises when one party makes extremely risky decisions knowing that it is insulated from the negative effects of the risk and the other party will have to bear the costs instead. This is oftentimes linked to the principal – agent problem as shareholders bear the risk of poor management decisions (Ross, 1973) (Heath & Norman, 2004) (Jenson & Meckling, 1976) (McColgan, 2001).

Stakeholder Theory

Stakeholder theory builds on the shareholder theory, stating that in addition to shareholders, a company has a responsibility to a wider group of stakeholders, such as communities, other

firms and employees. A stakeholder, in this context, would represent any individual, group or entity that would be affected by the actions of the business. This theory is commonly used to support corporate social responsibility. Stakeholder theory represents a balancing act, whereby the needs of the shareholders must be met, whilst also meeting the needs of other stakeholders (Donaldson & Preston, 1995) (Heath & Norman, 2004).

Stewardship Theory

Stewardship is a contrast to agency theory and theorises that company executives generally have interests that are aligned with those of shareholders. The theory states that on their own, company executives will choose to serve the interests of shareholders, deciding that serving the interests of the shareholders will ultimately be to their benefit. This occurs because maximising shareholder wealth requires profit and performance maximisation, which benefits and protects the careers, reputations, salaries and job security of those executives. (Fama, 1980) (Cannella, Daily, & Dalton, 2003).

2.5 Efficiency Concept

Efficiency as a concept belongs to the board measures of performance assessment. The efficiency concept involves the determination of desired output based on total inputs or the required inputs to produce a pre-determined output. The concept measures the productivity of a business and how efficiently it is using its assets or inputs. The efficiency concept is of particular importance to the insurance industry, as it relates to a core function of insurers, which is the underwriting of insurance policies. The underwriting of insurance policies requires the risk assessment of individuals, businesses and assets, and to avoid significant losses, insurers need to carefully perform the risk assessment and underwriting process. Thus, improved risk assessment and underwriting processes would be expected to minimise the incurred losses, which would result in improved efficiency. Consequently, the effect of underwriting processes and risk management on the efficiency of South African insurers represents a viable area of further study. (Cummins & Weiss, 1998) (Cummins, Tennyson, & Weiss, 1999)

Performance assessment tools are classified into financial and economic performance indicators. Traditionally, the evaluation of performance in the financial services industry has favoured the use of financial indicators in the accounting ratios. Although commonly used, ratio analysis as a performance measure has various disadvantages: It is difficult to determine

the value that represents an optimal ratio; ratios can be easily manipulated through the manipulation of the financial statements; and company ratios on their own do not allow for meaningful analysis unless compared to other firms in the industry or industry averages. When applied to the insurance industry, different accounting and actuarial practices used by various insurance firms can make comparisons difficult. Many researchers view efficiency methodologies as superior to financial ratio analysis, as performance measurement can be summarised into one value, which determines whether a firm is efficient or not. Cummins and Weiss (1998) state that efficiency ‘refers to how well firms are performing relative to the existing technology in the industry’. Applied to insurance markets, efficiency refers to the usage of inputs (resources) to produce a firm’s outputs (revenue, number and/or value of policies and/or premiums). (Calabrese & Rafferty, 2003) (Kader, Adams & Hardwick, 2010) (Cummins & Weiss, 1998).

2.5.1 Efficiency Estimation Techniques

Efficiency analysis can be divided into two main approaches, the econometric approach and the mathematical programming approach. This section discusses the two approaches in estimation firm efficiency.

- **Parametric Techniques**

The econometric approach can be further divided into four approaches: the stochastic frontier approach (SFA), the distribution-free approach (DFA) and the thick frontier approach (TFA), with SFA being the most used approach. Parametric techniques are characterised by the assumption of the inefficiency terms distribution, which Seiford and Thrall (1990) argue may be the technique’s main disadvantage. (Eling & Luhn, 2010)

Stochastic Frontier Approach (SFA)

The SFA uses a composed error model with asymmetrically distributed inefficiencies and symmetrically distributed random error terms, allowing for the estimation of inefficiency while accounting for random noise. The method utilises regression with two error terms, one which measures inefficiency and the other statistical noise. (Baek & Pagan, 2002) (Eling & Luhn, 2010)

Distribution-free Approach (DFA)

The DFA owes its name to the lack of structure of distributions, as the approach does not assume arbitrary distributions but rather assumes that the efficiency of each company is constant over time (Eling & Luhn, 2010). The approach requires a few years of data. (Eling & Luhn, 2010) (Berger A. N., 1993)

Thick Frontier Approach (TFA)

The thick frontier approach assumes that high and low quartile firms experience inefficiencies differently (Eling & Luhn, 2010). Size categories are selected, and firms are separated according to size (Caudill, 2002).

- **Non-parametric Techniques**

Non-parametric techniques consist of data envelopment analysis (DEA) and the free disposal hull approach (FDH). Data envelopment analysis (DEA), which measures the relationship between a firm's outputs against its inputs, is the most commonly used mathematical programming approach. The DEA model was developed through the works of Charnes, Cooper and Rhodes (1978, 1981) and Farrell (1957), in trying to measure efficiency using a combination of multiple inputs and outputs applicable to a variety of firms. (Charnes, Cooper, & Rhodes, 1978) (Charnes, Cooper, & Rhodes, 1981) (Farrell, 1957) (Seiford & Thrall, 1990)

Unlike the parametric techniques discussed above, the DEA technique makes no assumptions regarding the distribution of the inefficiency terms, but rather measures the efficiency of a firm relative to the efficiency frontier. The popularity of the technique is also due to its ability to expose relationships that would otherwise not be exposed when using other techniques. The DEA technique consists of two assumptions under which efficiency scores are estimated, variable returns to scale (VRS) and constant returns to scale (CRS). Constant returns to scale assumes that a change in input levels will lead to a proportionate change in output levels whereas variable returns to scale assumes that a change in input levels will lead to a greater than proportionate change in output levels (increasing returns to scale) or a less than proportionate change in output levels (decreasing returns to scale). While allowing for increasing and decreasing returns to scale, VRS also allows for the possibility of constant returns. When constant returns to scale are not possible, it is assumed that variable returns to

scale apply. An assumption of variable returns to scale is usually appropriate when dealing with multiple inputs, as a change in one input is unlikely to have a proportionate effect on output levels. Variable returns to scale are also appropriate when dealing with arbitrary input and output levels. (Thanassoulis, 2001) (Golany & Yu, 1997) (Banker & Thrall, 1992)

The free disposal hull approach (FDH) requires fewer assumptions than other techniques. The technique consists of two steps; the first step creates or estimates the free disposal hull boundary or frontier, with the second step determining efficiency relative to the FDH boundary by calculating the distance of output and input points from the frontier. A weakness of FDH is its sensitivity to observations in the data set, with an increase in sample size increasing the possibility of certain observations dominating and skewing the results. The frontier of the free disposal hull approach may also be unduly influenced by outliers, necessitating the need for the elimination of outliers. (Daraio & Simar, 2007) (De Borger, Kerstens, Moesen, & Vanneste, 1994)

2.5.2 Input and Output Variables for Insurance Services

Insurance companies have three main inputs: labour; business services and material; and, capital, all of which are used to produce the three main activities performed by insurers, i.e. risk-pooling and risk-bearing; financial services; and financial intermediation (Eling & Luhnen, 2010). The choice of inputs and the relevant proxies is usually made by applicability and availability of information. (Cummins, Tennyson, & Weiss, 1999) (Jeng, Peng, & Wang, 2007)

Inputs

Labour consists of agent and non-agent labour while capital can be split into equity and debt financing. Labour inputs can be calculated using employee costs or, when the data is available, number of employees and hours worked. Business services can be proxied by expenditure on items like advertising and communication. All three main inputs can be utilised; labour and capital are often used as inputs for insurance efficiency studies, as these are often viewed as the more important inputs. (Eling & Luhnen, 2010) (Cummins, Tennyson, & Weiss, 1999) (Jeng, Peng, & Wang, 2007)

In analysing the efficiency of Indian life insurance firms, Chakraborty (2016) analysed 20 efficiency studies on the insurance industry published during the 2005–2015 period. She

noted that most of the studies made use of operating expenses as input variables. Some of the studies narrowed down the operating expenses and utilised only labour expenses or employee-related costs. Chang and Chen (2010) noted that due to the different accounting systems used by insurers, it may often be difficult to identify and separate all labour related and business-service expenses. It is therefore more reasonable to utilise total expenses. Chang and Chen (2010) also noted that, in addition to expenses, equity and debt capital were also utilised by some studies.

Outputs

Risk-pooling and risk-bearing activities are usually represented by benefits paid, as they would approximate the funds pooled by all policy-holders and subsequently paid out to those policy-holders who have incurred losses to warrant the benefit payments. For the long-term insurance market, how the insurers invest assets is of great importance, particularly for policies such as life insurance and annuities. As insurers invest the funds received from policyholders, invested assets — or the increase or return on invested assets — are appropriate proxies for the financial intermediation function (Eling & Luhnen, 2010). Additionally, premiums earned, or the number of policies, may be used as an output, as the premiums received are necessary to produce the three main activities of insurers. Most studies use a mix of these outputs, such as benefits paid and return on invested assets. (Eling & Luhnen, 2010) (Cummins, Tennyson, & Weiss, 1999) (Jeng, Peng, & Wang, 2007) (Alhassan & Biekpe, 2015) (Chang & Chen, 2010)

2.6 Empirical Literature

The empirical examination of efficiency of insurance markets has received considerable attention over the past two decades. Evidence from three major reviews show a growth in the insurance efficiency literature from eight studies surveyed by Berger and Humphrey (1997); 21 studies by Cummins and Weiss (2000) and 95 studies by Eling and Luhnen (2010). The most recent survey by Eling and Luhnen (2010) reveals that 58% of the studies used DEA, 23% SFA, 7% DFA and 1% FDH, with the remaining 11% utilising a combination of approaches. In addition, evidence from the empirical literature also highlights skewed focus on insurance markets in U.S.A, Europe, Asia and Australia; with very few studies focused on insurance markets in Africa. The studies have broadly explored the effects of organisational form, distribution systems, market structure, mergers, equity, financial risk and regulatory changes on various forms of efficiency. For instance, Blomqvist and Johansson (1997)

examined the relationship between efficiency and public/private insurance, with the aim of determining whether there are efficiency gains to be made by public-private partnerships (PPP) in the insurance sector. In comparing a purely private insurance system to a PPP system, Blomqvist and Johansson (1997) found that a purely private insurance system will typically be more efficient than a PPP system, suggesting that PPP systems should only be embarked on for reasons other than efficiency. In Asia, Fukuyama (1997) looked at the productive efficiency and productivity changes of Japanese life insurance companies; while Chou and Hao (2005) utilised the distribution-free approach to estimate inefficiency and its causes in 26 Taiwanese life insurers, finding that efficiency was a result of economies of scale, market share and product diversification. Rai (1996) examined the cost efficiencies of insurance firms in 11 European countries between 1988 and 1992, using the stochastic cost frontier model and the distribution-free model. (Rai, 1996) (Fukuyama, 1997) (Chou & Hao, 2005) (Eling & Luhnen, 2010)

Cummins, Tennyson and Weiss (1999) investigated the relationship between mergers and acquisitions and efficiency of US life insurers. Cummins et al. (1999) found a positive relationship between mergers and acquisitions and efficiency, with merged or acquired firms being more efficient than firms that have not had any mergers and acquisitions. Due to increasing competition and more stringent solvency requirements, insurers are forced to find new ways of decreasing costs, with many believing that economies of scale would greatly contribute to cost reduction. Thus, the findings of the study encourage mergers and acquisitions for insurers so that they can benefit from economies of scale and efficiency gains. Choi and Weiss (2005) examined the relationship between market structure and performance of property-liability insurers over the 1992–1998 period. Choi and Weiss (2005) found that cost-efficient firms have lower prices but higher profits, while revenue-efficient firms charge higher prices with higher profits. The results indicate that less focus should be placed on market structure, and more on efficiency – both cost and revenue efficiency – as that leads to higher profits. (Cummins, Tennyson, & Weiss, 1999).

Prompted by the increasing importance of corporate governance due to corporate failures resulting from weak governance systems and the lack of available research on the topic, Diacon and O'Sullivan (1995) examined the relationship between corporate governance and performance of UK insurance companies. The study focused on better understanding corporate governance instruments and their inter-relationships and then determining the effect

these governance instruments have on performance. The study included both short-term and long-term insurers, looking at corporate governance instruments, such as ownership structure, board composition, board subcommittees and CEO characteristics. Diacon and O'Sullivan (1995) were interested only in the effect of independent governance instruments after accounting for correlation; the corporate governance indicators could be grouped into the following categories: formal governance; chairman influence; CEO appointment; CEO influence and tenure; and, non-executive director influence. The study found a positive relationship between formal governance structures (such as subcommittees) and performance for short-term insurers, while excessive formal governance structures may unnecessarily preoccupy management and firm resources, resulting in management becoming more risk averse, which may negatively impact performance. Non-independent non-executive directors were found to have a positive impact on performance and long CEO tenures were found to have a negative impact on performance over time. Diacon and O'Sullivan (1995) also found the positive relationship between corporate governance and performance to be weaker in larger firms. Notably, the study found that corporate governance instruments have different effects on the performance of long-term insurers as compared to short-term insurers. (Diacon & O'Sullivan, 1995)

Hsu and Petchsakulwong (2010) investigated the relationship between corporate governance and efficiency in the Thai non-life insurance industry. The study used individual corporate governance indicators as a measure of corporate governance, namely board size; board independence; board diligence; audit committee size and diligence; and financial expertise. Efficiency was measured using DEA methodology and based on 18 public non-life Thai insurers. To improve statistical efficiency, the study employed truncated, bootstrapped regression models to determine the relationship between efficiency and the corporate governance variables. The results showed that corporate governance does affect the efficiency of non-life insurers. Board independence and diligence was found to be positively correlated with firm efficiency, while audit-committee size was found to be negatively correlated with firm efficiency. (Hsu & Petchsakulwong, 2010)

Kader, Adams & Hardwick (2010) investigated the relationship between corporate governance and the cost efficiency of Takaful Insurance companies, utilising DEA measures to determine efficiency and specific and common corporate governance variables as a measure of corporate governance. Kader, Adams & Hardwick (2010) found the number of

independent directors to be insignificant, which supports stewardship theory, as the executives who have a better knowledge of the business provide more value and are naturally incentivised to act in the interests of shareholders and the firm. (Kader, Adams & Hardwick, 2010) (Arjomandi, Ruhul, & Seufert, 2016)

Board size was found to have a positive relationship with bank efficiency, indicating that a larger board provides more value to a firm. The financial services industry tends to be highly specialised, even more so in the insurance industry, and it would be reasonable to expect that, because of the specialised nature of the banking and insurance industries, an effective board would be one filled with all the necessary skills and experience required, which is potentially difficult and self-limiting in a small-sized board. (Kader, Adams & Hardwick, 2010) (Arjomandi, Ruhul, & Seufert, 2016)

Jeng, Peng and Wang (2007), contrary to other Asian studies on efficiency and corporate governance, found that corporate governance does not play an important role in influencing the efficiency of life insurance firms in Taiwan. In line with insurance literature, the DEA approach was used as a measure of firm efficiency.

Huang et al. (2011) found that corporate governance has a positive effect on firm efficiency, as most significant corporate governance variables have a positive effect on firm efficiency. Importantly, Huang et al. (2011) found that although on an overall level, corporate governance has a positive effect as expected, it also has some unexpected effects, and which may warrant further investigation beyond the scope of this study. This may tie in with an important question raised by Sibindi (2015) on the effect of over-regulation in the insurance industry, which may end up having unintended and undesirable effects.

Most of studies on corporate governance and efficiency look at the effect of individual corporate governance variables on firm efficiency. The corporate governance variables in these studies are selected using past literature combined with the effect of agency costs and moral hazard. Jeng, Peng and Wang (2007) found a significant relationship between corporate governance variables and the efficiency of Taiwanese insurance firms, using data envelopment analysis. For non-life insurers, insider ownership, cash-flow rights and independent non-executive directors had a positive effect on efficiency while board size and CEO duality had negative effects on efficiency. Notably, Jeng et al. (2007) did not find a

significant relationship between corporate governance variables and the efficiency of life insurers (Jeng, Peng, & Wang, 2007).

While it can be noted that these individual variables influence firm efficiency, it is also useful to determine the effect of all corporate governance variables, working together, on firm efficiency. Firms use several corporate governance variables to protect shareholder rights; some of which may improve firm efficiency, and while some may be detrimental to firm efficiency, yet others may have no effect.

Since the recent review by Eling and Luhnen (2010), a considerable number of studies have examined efficiency of insurance markets in Africa. For instance, Barros and Wanke (2014) assessed the efficiency of life and non-life insurers in Mozambique over the 2002–2011 period, using a two-stage DEA approach. Barros and Wanke (2014) found that efficiency of Mozambican insurers was driven mainly by ownership rather than market share, as private firms tended to have higher efficiency levels than public firms. Furthermore, the study noted an increase in efficiency levels with firms of Portuguese origin; foreign firms (firms of South African origin) had lower efficiency levels, indicating that cultural aspects play a role in efficiency in the Mozambican market. Barros and Wanke (2014) suggest that firms with lower efficiency levels should follow the same procedures of their more efficient counterparts, to improve efficiency. (Barros & Wanke, 2014)

Barros, Dumbo and Wanke (2014) analysed the efficiency of seven Angolan insurance companies over the 2003–2012 period. Insurance penetration in Africa (excluding South Africa) is low; Angola has a small insurance market consisting of only eight insurance companies. The approach used is like that of Barros and Wanke (2014), using data envelopment analysis and neural networks, with operating costs, number of employees and capital as input variables and premiums earned and ceded reinsurance as output variables. The study also found that cultural aspects play a role in efficiency in the Angolan market, as efficiency levels tended to increase with firms of Portuguese origin. This is in line with the findings of Barros and Wanke (2014) in Mozambique, suggesting that cultural aspects play a strong role in African countries with Portuguese influences. Additionally, Barros et al. (2014) noted a capacity shortfall in the Angolan industry; the industry would benefit from mergers and acquisitions due to the small size of the insurers. Merging or acquiring firms with best-practice procedures and higher efficiency levels would be expected to improve the efficiency

and capacity constraints of the merged firm. (Barros & Wanke, 2014) (Barros, Dumbo, & Wanke, 2014)

In West Africa, Barros, Caporale and Ibiwoye (2008) performed an efficiency analysis of the insurance industry in Nigeria and found that Nigerian firms experienced declining efficiency over the 1997–2003 period, due to inadequate management, scale and technology. Unlike Barros et al. (2014), size was found to have a negative effect on efficiency, owing to diseconomies of scale. In Ghana, Ansah-Adu et al. (2012) examined the efficiency and efficiency determinants of Ghanaian insurers. Using data envelopment analysis, inputs were measured by total capital, operating costs and investments, with output variables of profit or loss, net premium and investment income. The study found life insurers to be more efficient than non-life insurers, possibly due to the increased competition in the life insurance market. Unlike the findings of Barros and Wanke (2014), market share was found to be a key determinant of efficiency and firms with higher efficiency were characterised by less equity or more debt, suggesting that inefficient firms have much to gain from increased leverage. While Barros et al. (2014) found a negative relationship between size and efficiency, Ansah-Adul et al. (2012) found a significant positive relationship between size and efficiency, owing to economies of scale. Furthermore, although Barros and Wanke (2014) found a significant positive relationship between ownership and efficiency, Ansah-Adul et al. (2012) found ownership to have an insignificant effect on efficiency. (Ansah-Adu et al., 2011) (Barros & Wanke, 2014) (Barros et al., 2014)

In South Africa, Alhassan and Biekpe (2015) examined efficiency, productivity and returns-to-scale economies in the non-life insurance industry in South Africa. Using input variables of labour, business services and capital, and output variables of net premium earned, claims incurred and investment income, Alhassan and Biekpe (2015) employed the data envelopment analysis technique and Simar and Wilson's (2007) bootstrapping procedure. Contrary to the findings of Barros et al. (2014) and Ansah-Adul et al. (2012), Alhassan and Biekpe (2015) found a non-linear, U-shaped relationship between size and efficiency. The study also found a positive relationship between product line diversification and efficiency, and a negative relationship between reinsurance activities and efficiency. Unlike Barros et al., (2008), Alhassan and Biekpe (2015) found a negative relationship between leverage and efficiency, a notable finding, as increased leverage is expected to

improve returns, profitability and efficiency; Barros et al. (2008) found a positive relationship between leverage and efficiency. Alhassan and Biekpe (2016) conducted another study on the non-life insurance industry in South Africa, examining the effect of competition on efficiency. The study found a positive relationship between competition and efficiency, suggesting that when there are more firms in the market, the more efficient firms can compete effectively. (Alhassan & Biekpe, 2016).

2.7 Summary

As can be observed from the efficiency studies on insurance markets in Africa, it appears there is a gap in the efficiency literature with regards to corporate governance and efficiency relationship in insurance markets in Africa. The mostly widely-explored effect of corporate governance mechanism has been in relation to financial performance indicators. For example, Ntim (2013) investigates the relationship between corporate governance and performance in listed firms on the JSE in South Africa. The author generated a corporate governance index based on the King III Code on Corporate Governance and found a significant positive relationship between corporate governance provisions and financial performance. Unlike the insurance market, the sample employed by Ntim (2013) is required to comply with the King Code (JSE Limited, 2012). Hence, this study focuses on the long-term insurance market, a comprehensive corporate governance index based on King III would not be appropriate if the insurance sector does not make use of the King provisions. However, the inclusion of the King III Code on governance for this study is substantiated by the legal requirement of South African companies to comply with the Companies Act of 2008, whose fundamentals are similar to those of King III (The Companies Act, 2008). Additionally, research undertaken by Sibindi (2015) concludes that a significant majority of the South African insurance sector complies with the King III Code, apart from the requirement for the disclosure of directors' remuneration.

Table 2.5: Taxonomy of Efficiency Studies in the Insurance Market

Authors	Countries	No. of firms	Sample Period	Method	Inputs	Output	Efficiencies estimated	Application category
Ansah-Adu et al. (2012)	Ghana	30	2006-2008	DEA	Total capital, total operating cost and total investments	Profit or loss, net premium and investment income	Cost	Evaluation of efficiency and efficiency determinants
Adams et al. (2010)	10 Islamic countries	26	2004-2006	DEA	Labour and capital	Gross premiums	Cost, technical, pure technical, scale and allocation	Corporate governance
Alhassan and Biekpe (2015)	South Africa	76	2007-2012	DEA and Malmquist index	Labour, business services and capital	Net premiums earned, incurred losses and investment income	Technical, pure technical and scale	Efficiency determinants and returns to scale
Alhassan and Biekpe (2016)	South Africa	75-80	2007-2012	SFA	Labour, business services, debt and equity capital	Incurred claims and investment income	Cost and profit	Competition
Barros and Wanke (2014)	Mozambique	5	2002-2011	DEA	Operating costs, number of employees, wages and capital	Claims paid, profits paid, premiums earned, ceded reinsurance	Technical and scale	Evaluation of efficiency
Barros et al. (2008)	Nigeria	25	1994-2005	DEA	Total capital, total operating costs, total number of employees and total investments	Profit and Loss account, net premiums, settled claims, outstanding claims and investment	Technical and scale	Evaluation of efficiency and efficiency determinants
Barros et al. (2014)	Angola	7	2003-2012	DEA	Operating costs, number of employees,	Claims paid, profits paid, premiums earned,	Technical and scale	Evaluation of efficiency and efficiency determinants

					wages and capital	ceded reinsurance		
Bikker, J.A and Van Leuvensteijn (2008)	The Netherlands	84 - 105	1995-2003	SFA	Acquisition costs and other costs	Premium income, number of outstanding policies unit-linked fund policies, insured capital and total insured annuities	Cost	Evaluation of efficiency and competition
Chakraborty (2016)	India	18	2008-2009 to 2014-2015	DEA	Operating expenses, commission and investments	Net premiums, benefits paid and income from investments	Technical and scale	Evaluation of efficiency
Chang and Chen (2010)	Taiwan	24	1997-2006	DEA – Malmquist index	Equity capital and total expenses	Premium income	Technical and scale	Evaluation and evolution of efficiency
Choi and Weiss (2005)	United States	n/a	1992-1998	SFA	Labour, materials and equity capital	Losses incurred and total invested assets	Cost and revenue	Market structure
Chou and Hao (2005)	Taiwan	26	1977-1999	DFA, DFP	Labour, physical capital and claims	Ordinary life insurance, accident and health premiums, group life insurance premiums and investments	Scale	Evaluation of efficiency
Cummins and Zi (1998)	United States	445	1998-1992	DEA, DFA, FDH, SFA	Labour, capital, materials	Benefit payments, additions to reserves	Technical, cost and allocation	Methodology
Cummins et al. (2004)	Spain	347	1989-1997	DEA	Labour, business services, debt and equity	Benefits paid	Technical, allocation, cost and revenue	Corporate governance

					capital			
Cummins et al. (1999)	United States	750	1988-1995	DEA	Home-office labour, agent labour, business services and financial capital	Incurred benefits and additions to reserves	Cost, technical, scale, allocation, revenue	Evaluation of efficiency and mergers
Fukuyama (1997)	Japan	25	1988-1993	DEA	Labour and capital	Insurance reserves and loans	Technical, scale and allocation	Evaluation of efficiency and organisational form
Hsu and Petchsakulwong (2010)	Thailand	16	2000-2007	DEA	Labour, equity capital, and materials and business services	Losses incurred and intermediation	Technical, allocation, cost and revenue	Corporate governance
Huang et al. (2011)	United States	28	2000-2007	DEA	Labour, business services, equity capital	Losses incurred and total invested assets	Technical and cost	Corporate governance
Jeng et al. (2007)	United States	11	1979-2001	DEA	Labour, business services and equity capital	Benefit payments	Technical, cost and allocation	Evaluation of efficiency and ownership/demutualization
Luhnen (2009)	Germany	295	1995-2006	DEA	Labour, business services and capital	Claims incurred and total invested assets	Technical, cost, allocation, scale	Evaluation of efficiency and productivity
Rai (1996)	11 OECD countries	106	1988 - 1992	DFA, SFA	Labour, capital and benefits and claims	Total premiums	Cost	Evaluation of efficiency and country comparisons

Source: Author's design from review of empirical literature

CHAPTER THREE:

METHODOLOGY

3.1 Introduction

This chapter presents the methodology and procedures used for data collection and analysis of the long-term insurance market in South Africa. It presents the research design, strategy and empirical techniques applied, while also identifying the limitations of the research design and techniques used. Furthermore, the chapter includes a discussion of the various methodologies used in the insurance industry research literature and provides justification for the research design utilised for this study.

3.2 Research Design

The research undertaken is a quantitative explanatory study which aims to examine the relationship between corporate governance variables and firm performance. The results of the research are expected to identify the existence, significance and direction of the relationship between corporate governance and performance, as measured by efficiency.

3.3 Data Sources

The data to be used for this study consists of quantitative data. The data used for the study will be obtained from the annual reports of the selected insurers for the 2007 to 2014 period. The information contained in the annual reports is expected to be accurate, reliable and valid, as the annual reports are issued by the insurers themselves and audited by the relevant South African auditing firms. The use of information obtained directly from the annual reports of the selected firms is supported by Ntim (2013), who states that the use of analysts' corporate governance ratings creates a subjective analysis as the corporate governance ratings will be based on the analyst's opinion of the corporate governance quality. Thus, obtaining the corporate governance information directly from the annual reports of the selected firms will remove that bias.

3.4 Sample

There are currently 80 registered long-term insurers in South Africa (Financial Services Board, 2016). The sample for this study will consist of 73 registered long-term insurers, which is representative of the population, as the sample represents 91% of the long-term insurance market. It is of great importance that the sample is as representative as possible, for

the conclusions and findings of the study to be applied and useful to the long-term insurance industry as a whole.

3.5 Estimation Efficiency Scores: Data Envelopment Analysis

In line with efficiency studies by Alhassan and Biekpe (2015) in the short-term insurance market in Ghana, as well as Ansah-Adu et al. (2012) and Alhassan et al. (2015) on the insurance market in Ghana, this study employed the Data Envelopment Analysis (DEA) to measure insurance firm efficiency. DEA is the most commonly used measure of efficiency and has the advantages of allowing for multiple inputs and outputs. All deviations from the efficient frontier arise only from efficiency. (Arjomandi, Ruhul, & Seufert, 2016) (Eling & Luhn, 2010).

- Inputs

Following the arguments by Eling and Luhn (2010) as adopted by Alhassan and Biekpe (2015), this study defines inputs for the life insurance market into labour and business services, debt capital and equity capital. The proxy for labour and business services is management expenditure and sales and administration cost, while debt and equity capital are measured as the total debt and total equity respectively. These proxies are mostly motivated by data availability and are consistent with the empirical literature. (Alhassan & Biekpe, 2015) (Alhassan & Biekpe, 2016) (Jeng, Peng, & Wang, 2007) (Huang, Lai, McNamara, & Wang, 2011)

-Outputs

Efficiency output can be measured using incurred benefits and invested assets. An important role played by insurance companies is risk-pooling and financial intermediation. Incurred benefits, represented by payments received by policyholders, are often used as a proxy for risk-pooling in the life insurance market. Invested assets, representing investments made using premiums received from policyholders, are often used as a proxy for financial intermediation in the insurance industry. Thus, incurred benefits and invested assets are used as efficiency outputs. (Eling & Luhn, 2010) (Cummins, Tennyson, & Weiss, 1999) (Jeng, Peng, & Wang, 2007)

3.6 Empirical Model

In examining the relationship between corporate governance and efficiency in the Long-term insurance market in South Africa, this study adopts the empirical model of Alhassan and Biekpe (2015) and Luhnén (2009) as defined below;

$$EFF_{i,t} = \beta_0 + \beta_1 BSIZE_{i,t} + \beta_2 NED_{i,t} + \beta_5 ASIZE_{i,t} + \beta_7 CEOT_{i,t} + \beta_8 ADIND_{i,t} + \beta_2 X_{i,t} + \varepsilon_{i,t}$$

where i and t denote insurer and year respectively; EFF is the DEA estimate of efficiency; BSIZE, NED, ASIZE, CEOT and ADIND represents board size, non-executive directors, audit committee size, CEO tenure and audit committee independence respectively, and X represents a list of firm level and control variables made up of size, reinsurance and leverage.

3.6.1 Description of Variables

Corporate Governance Variables

Connelly and Limpaphayom (2004) found a positive relationship between board independence and profitability in the insurance industry. With respect to board size, boards appear to be less effective as they grow; as decision-making becomes less efficient. Studies by Yermack (1996) and Eisenberg, Sundgen and Wells (1998) support this theory, finding a negative relationship between board size and corporate value. Conversely, empirical evidence by Dalton, Ellstrand and Johnson (1999) and Dowen (1995) found board size to be positively related to profitability. This could be attributed to the fact that a larger board allows for a wider variety of skills and expertise, which would improve decision-making and thus the effectiveness of the board. The evidence on board composition and size appears contradictory and it would be important to determine their effect on the performance of firms in the long-term insurance industry. The importance and relevance of these corporate governance mechanisms supports their inclusion as a corporate governance indicator for this study. (Fama & Jensen, 1983) (The Institute of Directors in Southern Africa, 2009) (Connelly & Limpaphayom, 2004) (Dowen, 1995)

The argument around audit committee size is similar to that involving board size, with larger audit committees allowing for greater skills and expertise while also resulting in inefficient decision-making due to the large number of players involved. Huang, Lai, McNamara and Wang's (2011) study on efficiency expected a positive relationship between audit committee independence and financial expertise and firm efficiency in the US insurance industry. The

actual results of the study, utilising data envelopment analysis (DEA) efficiency measures, found a significantly negative relationship between audit committee financial expertise and efficiency. Huang, Lai, McNamara and Wang (2011) utilised the DEA approach for its advantage of allowing the use of multiple inputs and outputs.

The corporate governance variables will be measured as follows:

- i. *Board size (BSIZE)*: Board size will be measured by the number of directors on the board.
- ii. *Board independence (NED)*: Board independence will be measured by the percentage of board members who are non-executive directors
- iii. *Audit committee size (ASIZE)*: Audit committee size will be measured by the number of audit committee members.
- iv. *CEO tenure (CEOT)*: CEO tenure will be measured by the number of years the CEO has served on the board.
- v. *Audit independence (ADIND)*: Audit independence will be measured by the proportion of independent non-executive directors on the audit committee.

3.6.2 Control Variables

The control variables selected for use in this study are commonly used in the insurance literature.

i. Firm Size

Firm size may strongly influence the results of the study, as it would be expected that larger firms may have increased efficiency, consequently holding this constant will remove the benefits or disadvantages of firm size, as this is not the aim of the study (Luhnen, 2009).

ii. Reinsurance

Reinsurance is used as a risk management tool by insurers to reduce bankruptcy risk and as protection from catastrophes (Alhassan & Biekpe, 2016). Sing'ombe (2016) found a positive relationship between reinsurance and financial performance. Thus, the effect of reinsurance is held constant to remove its effect on the results of the study.

iii. *Leverage*

Increased leverage has been proven to increase the efficiency of a firm, which may distort the results of the study (Luhnen, 2009).

3.7 Estimation Technique

The estimation technique used is the truncated bootstrapping regression technique, employed by Simar and Wilson (2007). The bootstrap procedure was introduced by Simar and Wilson (2007) to address the shortfalls of DEA when estimating efficiency scores. The truncated bootstrapping regression technique can be done using a single bootstrap procedure or a double bootstrap procedure. Simar and Wilson (2007) noted that the double bootstrap procedure improved statistical efficiency in second-stage regression.

Simar and Wilson (2007) propose two bootstrap procedures, with the first procedure improving inference without accounting for the bias term, while the second procedure provides bias-corrected estimates. The second procedure, ‘Algorithm 2’, will be used in this study. (Simar & Wilson, 2007)

The procedure involves the following steps:

- DEA is used to estimate efficiency
- In the truncated regression, an estimate of β is attained, using the method of maximum likelihood (Huang et al., 2011) the efficiency scores are regressed using truncated maximum likelihood estimation (Balcombe, Davidova, & Latruffe, 2007)
- Obtain n sets of bootstrap estimates
- These estimates are then integrated into a bootstrap procedure, which can correct for bias (Balcombe et al., 2007)
- Another bootstrap procedure is performed, using the bias corrected scores from the previous bootstrap and confidence intervals are produced for the efficiency scores (Balcombe et al., 2007). (Simar & Wilson, 2007)

CHAPTER FOUR:

DISCUSSION OF RESULTS

4.1 Introduction

This chapter presents the results of the analysis of the relationship between corporate governance and efficiency of 73 long-term insurers over the period 2007 to 2014, with the analysis performed in two stages. The stage 1 results that summarise the efficiency statistics of the 73 firms will be presented first, followed by the truncated bootstrap regression results.

4.2 First Stage Results

4.2.1 Efficiency Analysis

The summary statistics of the efficiency scores are presented in Table 4.1. The results of both the original and bias-corrected efficiency scores are presented in Table 4.1. The first stage results show a mean technical efficiency (BC-TE) score of 21.15%, pure technical efficiency (BC-PTE) score of 47.77% and a scale efficiency (BC-SE) score of 47.45%. This is significantly different from the findings of Huang et al. (2011) who found a mean technical efficiency score of 90% in the U.S. property liability insurance industry. Similar findings were made by Jeng et al. (2007), who found a mean technical efficiency score of 87% for Taiwanese life insurers and 94% for Taiwanese property liability insurers. Adams et al. (2010) found a TE score of 55%, PTE score of 74% and SE score of 71% for Takaful insurance companies. The efficiency scores are significantly lower than those of South African non-life insurers, which Alhassan and Biekpe (2015) found to be 52% for TE, 59% for PTE and 87% for SE, an indication that the long-term insurance industry is less efficient than the short-term insurance industry in South Africa. The pure technical efficiency score and scale efficiency score are almost equal, indicating that the technical inefficiency is attributable to pure technical inefficiency and scale inefficiency. A firm is technically efficient if it obtains maximum output from the least amount of inputs. With an average technical efficiency score of 21.15%, South African long-term insurers are, on average, using substantially more inputs than necessary to obtain maximum output. This implies that these insurers are not using inputs efficiently and would benefit from a reduction in inputs such as labour and administration costs, debt and equity. A firm is operating at its optimal size if its scale efficiency score is 1; with a scale efficiency score of 47.45%, long-term insurance firms are not operating at optimal size and are either too small or too large. Undersized firms would

benefit from mergers and acquisitions to obtain economies of scale benefits, while oversized firms would benefit from downsizing to minimise decreasing economies of scale.

Table 4.1: Descriptive Statistics of Efficiency Scores

	TE	BC-TE	PTE	BC-PTE	SE	BC-SE
Mean	0.3230	0.2115	0.6148	0.4777	0.5415	0.4745
Median	0.1551	0.1074	0.6265	0.5096	0.5227	0.4597
Std. Dev	0.3287	0.2046	0.3548	0.2710	0.3572	0.3278
Minimum	0.0229	0.0124	0.1031	0.0813	0.0744	0.0509
Maximum	1.0000	0.5909	1.0000	0.8271	1.0000	0.9318
N	483	481	483	483	483	481

Note: PTE=Pure Technical Efficiency; TE=Technical Efficiency; SE=Scale Efficiency; BC= Bias Corrected; Source: Author's estimate from research data

The correlation between original and bias-corrected efficiency scores are presented in Table 4.2, which shows that the bias-corrected scores are lower than the original scores. The original and bias-corrected scores are highly correlated, in the 96-97% range, leading to the conclusion that the scores are similar (Huang et al., 2011).

Table 4.2: Correlation Between Original and Bias-corrected Efficiency Scores

	Original	N	Bias-corrected	N	Correlation
TE	0.3230	483	0.2115	481	0.9715***
PTE	0.6148	483	0.4777	483	0.9727***
SE	0.5415	483	0.4745	481	0.9628***

*Note: PTE=Pure Technical Efficiency; TE=Technical Efficiency; SE=Scale Efficiency; BC= Bias Corrected; *** denotes significance at 1%; Source: Author's estimate from research data*

Table 4.3 reports the evolution of efficiency scores of South African long-term insurers over the period 2007 to 2014. From 2007 to 2010, the South African long-term insurance industry experienced a significant decline in technical efficiency. In four of the years under analysis, technical efficiency remained below 20% and below the average score for the entire 2007 to 2014 period. The average technical efficiency score during the period under review appears slightly inconsistent, however, apart from the jump in 2011; the scores seem to show a downward trend of decreasing technical efficiency until 2014. Overall, the pure technical efficiency scores show an upward trend, peaking at 61% in 2014. The scale efficiency scores experienced a downward trend, from 85% in 2007 to 49% in 2014. In the latter years (2012 to 2014), the pure technical efficiency scores are higher than the scale efficiency scores, suggesting that during this period the technical efficiency was mainly due to scale inefficiencies. Therefore, it would be expected that an increase in scale efficiency would have a substantial impact on technical efficiency.

Table 4. 3: Evolution of Efficiency Scores (2007 -2014)

Periods	TE	BC-TE	CI-UB	CI-LB	PTE	BC-PTE	CI-UB	CI-LB	SE	BC-SE	CI-UB	CI-LB	N
2007	0.4818	0.3262	0.4933	0.2986	0.5365	0.3739	0.5092	0.3092	0.9027	0.8545	0.9604	0.9556	56
2008	0.3731	0.2253	0.5030	0.3110	0.5266	0.3756	0.5064	0.3171	0.7105	0.6174	0.9845	0.9779	64
2009	0.2343	0.1470	0.2781	0.1678	0.6126	0.4744	0.5924	0.3935	0.4121	0.3512	0.4849	0.4604	69
2010	0.2176	0.1346	0.2387	0.1505	0.5977	0.4564	0.5753	0.3772	0.3554	0.2974	0.3622	0.3537	67
2011	0.3730	0.2484	0.3902	0.2305	0.6559	0.4981	0.6381	0.4026	0.5895	0.5226	0.6105	0.5761	38
2012	0.3012	0.1969	0.3308	0.2019	0.6569	0.5283	0.6395	0.4400	0.4757	0.4078	0.5188	0.4819	67
2013	0.2614	0.1631	0.2827	0.1748	0.6364	0.5066	0.6199	0.4223	0.4050	0.3376	0.4231	0.4044	61
2014	0.3949	0.2925	0.4172	0.2592	0.7067	0.6101	0.6984	0.5090	0.5619	0.4988	0.6021	0.5217	61
Average	0.3230	0.2115	0.3611	0.2213	0.6148	0.4777	0.5960	0.3967	0.5415	0.4745	0.6093	0.5828	483

Note: TE=Technical Efficiency; PTE=Pure Technical Efficiency; SE=Scale Efficiency; BC= Bias Corrected; CI-UB=Upper Bound Confidence; CI-LB=Lower Bound Confidence;

N=Observations;

Source: Author's estimate from research data

4.2.2 Descriptive Statistics

Table 4.4 reports the summary statistics of the corporate governance and control variables. The King Codes propose that non-executive directors should make up most of the board and audit committees should comprise only non-executive directors. The results show that on average, non-executive directors comprise 60% of the board of directors and 73% of audit committees, which shows that on average, long-term insurers in South Africa comply with the King Codes, Companies Act of 2008 and general good governance principles. This is in line with the findings of Sibindi (2015), who found that within the South African insurance sector, a significant majority complies with the King III Code. The King Codes recommend a board of directors comprised mainly of non-executive directors due to their independence and impartiality, as they are not involved in the day-to-day running of the business. Non-executive directors compose 60% of company boards included in our analysis, which is consistent with the provisions of the King Codes and good governance principles. The King Codes and the Companies Act of 2008 place great importance on the establishment of effective and independent audit committees, recommending that audit committees comprise a minimum of three members who are all independent, non-executive directors. On average, the insurers in our analysis have audit committees consisting of four members, of which 73% are independent. Although the four members exceed the minimum, the proportion of independent audit committee members is notably below the 100% recommended by the King Codes, which may be expected to have an impact on the effectiveness of the committee. Andrews, Kanun and Luo (2014) investigated the importance and effect of CEO tenure and found that the optimal CEO tenure amounted to 4.8 years; the average CEO tenure for insurers in our analysis amounted to five years. (The Companies Act, 2008) (The Institute of Directors in Southern Africa, 2009).

Table 4.4: Summary Statistics of Corporate Governance and Control Variables

	Mean	Median	Std. Dev	Min	Max	N
Board size	8	7	4	1	32	446
Non-Executive Directors (%)	60	63	22	0	100	446
Audit Committee size	4	4	2	0	12	431
CEO Tenure	5	4	4	0	18	290
Audit Independence (%)	73	75	29	0.00	100	289
Size	13.979	14.038	2.980	1.099	20.189	477
Reins	0.37	0.182	0.404	0.000	1.000	384
NPE	3.200	1.052	4.640	0.000	14.907	469

Notes: Size=firm size; Reins=Reinsurance usage; NPE=Leverage. Source: Author's estimate from research data

4.2.3 Correlation Results

The correlation matrix is presented in Table 4.5, no multicollinearity was observed among the independent or control variables, with all correlation coefficients well below 0.7, the multicollinearity threshold (Kennedy, 2008). The independent variables show very low correlation scores, with the highest correlation score being -0.319, significant at 1%, which shows a negative correlation between audit independence and audit size, indicating that a more independent audit committee would be smaller in size. Board size and firm size were positively correlated at 1% significance level, with a correlation score of 0.422, an indication that the larger the firm the larger the board size.

Table 4.5: Correlation Matrix

	1	2	3	4	5	6	7	8
1.BSIZE	1.000							
2.NED	0.142***	1.000						
3.ASIZE	0.132***	-0.133***	1.000					
4.CEOT	0.064	-0.019	0.096	1.000				
5.ADIND	0.015	0.219***	-0.319***	-0.069	1.000			
6.SIZE	0.422***	-0.029	0.073	0.108*	-0.012	1.000		
7.REINS	0.060	0.014	0.036	-0.014	0.007	0.018	1.000	
8.NPE	-0.110**	-0.135***	-0.091*	0.037	-0.144**	0.179***	-0.005	1.000

Notes: *BSIZE*= Board size; *NED*= Non-executive directors; *ASIZE*= Audit committee size; *CEOT*=CEO Tenure; *ADIND*=Audit Independence; *Size*=firm size; *Reins*=Reinsurance usage; *NPE*=Leverage ***, ** and * denotes significance at 1%, 5% and 10% respectively. Source: Author's estimate from research data

4.3 Second Stage Results: Corporate Governance and Efficiency

The second stage of the analysis the effect of corporate governance on estimate efficiency scores is presented in Table 4.6. The regression equation is first estimated using the Simar and Wilson (2007) bootstrapping technique discussed in the previous chapter. The Tobit estimation technique is also used as form of a robustness test. Overall, two (2) Models are estimated under each technique. The estimations under Model 1 only employ the corporate governance variables as the independent variables while Model 2 includes the three control variables in size, reinsurance and leverage, resulting in four regression outputs. The diagnostics from all the regression results indicate the statistical fitness of the models in explaining the variations in technical efficiency across long-term insurers in South Africa. Board size (*BSIZE*) was found to have a negative relationship with efficiency which indicates that long-term insurers with large board size have lower levels of technical efficiency. This result supports the establishment of smaller boards for increased efficiency. As discussed earlier, evidence on the effect of board size appeared contradictory. The results of this

analysis are consistent with those of Jeng, Peng, and Wang (2007) and Yermack (1996), who found a negative relationship between board size and corporate value. This seems to suggest that although a larger board allows for a wider variety of skills and expertise, a smaller board may be more effective, possibly due to quicker decision-making and a more cohesive team. However, board size is not a key driver of efficiency as it was not found to be significant.

The proportion of non-executive directors (NED) sitting on the board of directors has a negative relationship with efficiency, which is contrary to expectations, as a high number of non-executive directors would be expected to increase the effectiveness of the board. Since non-executive directors are not engaged in the day-to-day management of the business, the assumption is that they would be less likely to be easily influenced by management and would be able to robustly assess and question management and board decisions. The relationship is significant at 1%. These findings are consistent with those of Huang et al. (2011), who found that executive directors have a positive relationship with efficiency.

CEO tenure has a positive relationship with efficiency, which is significant at 5%. The longer the tenure of the CEO, the higher the efficiency of the firm, which is an indication that firms benefit from CEOs with experience. During the early years of a CEO's tenure, the CEO acquires more knowledge and expertise, which can be put to good use in later years. This is contrary to expectations as one would expect that extended tenure may result in complacency, dominance over the board and a lack of objectivity. However, our results appear to support the findings by Huang et al. (2011) that the expertise and firm-specific experience provided by the extended tenure overrides the negative aspects.

Consistent with Hsu and Petchsakulwong (2010), audit committee size has a negative relationship with technical efficiency, however this relationship was not found to be significant. This is similar to board size, although a larger committee size may bring a variety of opinions and expertise, leading to more effective monitoring, the variety of opinions may result in slower decision-making which may affect the efficiency of the committee. Our results show that a smaller committee is beneficial, as larger committees would reduce technical efficiency.

Audit independence has a positive relationship with efficiency, which was found to be significant at 5%. This is in line with expectations, as an audit committee oversees the external and internal audits of the business, financial statements, the finance function, risk

management, sustainability and integrated reporting, which are fundamental to the performance and sustainability of a business. An independent audit committee would be able to appropriately perform its duties without interference from management. These findings are in line with those of Chan and Li (2008), Klein (1998) and Huang et al. (2011).

To provide some robustness to results of the truncated bootstrapping technique, the study employs the Tobit regression technique which treats dependent variables as censored. The results from the Tobit estimates also presented similar results using the Simar-Wilson bootstrapping approach, except for audit size. Using Tobit regression, audit size was found to have a positive relationship with technical efficiency, significant at 10%. The results of our analysis provide enough evidence to reject our null hypothesis that there is no relationship between corporate governance and firm efficiency in the South African long-term insurance industry.

Table 4.6: Regression Results

Dependent variable: Technical Efficiency								
Models	Simar-Wilson Bootstrapping				Tobit			
	Model 1		Model 2		Model 1		Model 2	
	Coef.	z	Coef.	z	Coef.	z	Coef.	z
Constant	0.091 (0.637)	0.14	-1.607*** (0.442)	-3.64	0.429*** (0.114)	3.77	-0.235* (0.130)	-1.81
BSIZE	-0.029 (0.022)	-1.34	-0.012 (0.009)	-1.38	-0.008* (0.005)	-1.75	-0.007* (0.004)	-1.85
NED	-2.863*** (0.680)	-4.21	-0.257 (0.176)	-1.46	-0.327*** (0.100)	-3.27	-0.208** (0.086)	-2.43
ASIZE	-0.034 (0.068)	-0.5	0.056** (0.028)	2.02	0.021* (0.011)	1.83	0.023** (0.011)	2.08
CEOT	0.041** (0.020)	2.02	0.023*** (0.008)	3.05	0.003 (0.004)	0.69	0.003 (0.003)	0.94
ADIND	0.778** (0.394)	1.97	0.058 (0.123)	0.47	0.089* (0.049)	1.82	0.062 (0.045)	1.39
SIZE			0.078*** (0.019)	4.14			0.033*** (0.008)	4.23
REINS			0.507*** (0.131)	3.86			0.168*** (0.077)	2.17
NPE			0.009*** (0.002)	4.9			0.003*** (0.001)	3.46
Wald $\chi^2(12)$	27.49***		34.09***		66.64***		98.88***	
Prob > χ^2	0.0066		0.0033		0.000		0.000	
Bootstrap replications	2000		2000					
Log likelihood					39.958		71.072	
Year Dummies	Yes		Yes		Yes		Yes	
insurers					59		50	
Observations	201		174		201		174	

Notes: BSIZE= Board size; NED= Non-executive directors; ASIZE= Audit committee size; CEOT=CEO Tenure; ADIND=Audit Independence; Size=firm size; Reins=Reinsurance usage; NPE=Leverage; Bootstrapped standard errors in parentheses for the Simar-Wilson truncated regression ***, ** and * denotes significance at 1%, 5% and 10% respectively. Source: Author's estimate from research data

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This study investigates the relationship between efficiency and corporate governance in the long-term insurance industry in South Africa, using 73 long-term insurers which represent 91% of the market, over the 2007-2014 period. This chapter presents a summary of the study and conclusions, followed by policy recommendations based on the findings of the study and recommendations for future study based on the limitations of the study.

5.2 Summary of the Study

Simar and Wilson's (2007) truncated double bootstrapping approach was used to determine the relationship between efficiency and specific corporate governance variables in a two-stage analysis. In the first stage, firm efficiency is estimated using the data envelopment analysis (DEA) bootstrapping technique of Simar and Wilson (2007), which corrects for biases associated with non-parametric techniques. In the second stage analysis, the truncated bootstrapping regression technique is employed to examine the effect of corporate governance on the estimated efficiency scores. The corporate governance variables used were board size, board independence, audit committee size, CEO tenure and audit independence, while controlling for firm size, reinsurance usage and leverage. In the first stage, the average technical efficiency score amounted to 21%, indicating that the long-term insurers under analysis were operating at 21% efficiency, which is significantly lower than the average technical efficiency scores found by Adams et al. (2010), Alhassan and Biekpe (2015), Huang et al. (2011) and Jeng et al. (2007), which range from 52% to 94%. The second stage regression results show a significant relationship between technical efficiency and the corporate governance variables of non-executive directorship, CEO tenure and audit independence. CEO tenure and audit independence have a positive relationship with efficiency, while non-executive directorship has a negative relationship with efficiency which is contrary to expectations. Although not significant, audit committee size and board size were found to have a negative relationship with efficiency. The control variables of firm size, reinsurance usage and leverage were found to be significantly related to efficiency.

5.3 Conclusions

The findings indicate that long-term insurers in South Africa operated at high levels of inefficiency in the provision of insurance services during the period under review. Board size

and audit committee size were found to have a negative relationship with efficiency, although the relationship was not significant. This indicates that insurers do not benefit from larger boards and committees. It would be expected that larger boards and committees would allow for a greater variety of skills and expertise, but it may be possible that, due to the specialised nature of insurance, only a few directors with specialised expertise in the industry are needed. The results show that audit committee independence and CEO tenure have significant positive relationships with technical efficiency. Audit committee independence is a key aspect of corporate governance principles and the King Codes; thus, this relationship is expected since the average insurer in our analysis has an audit committee that is 73% independent. Notably, the number of non-executive directors on the board of directors is found to have a significant and negative relationship with technical efficiency. As non-executive directors are not engaged in the day-to-day management of the business and are usually completely independent of the business, this seems to confirm that long-term insurers benefit from directors with detailed knowledge of the business or industry, as non-executive directors may not have the same knowledge and expertise as they are not involved in the day-to-day management of the business. However, the negative relationship between non-executive directors and efficiency may not be an indication that non-executive directors do not add value. Non-executive directors compose a large proportion of audit committees, which has a positive effect on efficiency; thus the negative effect of non-executive directors may indicate a problem in the way that non-executive directors are used. Non-executive directors may be inadvertently limited in their ability to effectively contribute if they are not well-represented in important decision-making committees, such as the nomination and risk committees. Additionally, the King Codes require boards to meet a minimum of 4 times a year in order to be effective, thus non-executive directors on boards that meet less than four times a year may not have the opportunity to provide value. This represents a limitation to the findings, as more information is required in order to conclude that non-executive directors do not add value. (The Institute of Directors in Southern Africa, 2009)

5.4 Policy Recommendations

The findings of the study can be applied to the South African long-term insurance industry, as 91% of the industry was included in the study. Non-executive directors are necessary as part of industry regulations and ‘good corporate governance’, consequently for non-executive

directors to have a more positive impact on efficiency, insurers need to institute more rigid nomination and application processes and requirements to ensure that the non-executives are appropriately skilled and qualified. Additionally, more extensive orientation practices for new non-executive directors may be needed, followed by regular meetings of non-executive directors for them to remain up to date and as knowledgeable as executive directors. Adams et al. (2010) suggest that these results indicate that the role of non-executive directors needs to be clarified, and that non-executive directors without adequate financial expertise take a backseat and allow the board to be run by executive directors and the CEO, thus negating their purpose. Additionally, these findings may suggest that insurers should look at ex-management or ex-directors of other insurers to sit on their boards as non-executive directors. As noted earlier, the negative relationship between non-executive directors and efficiency may possibly be due to the under-representation of non-executive directors on sub-committees. The King Codes require all sub-committees, excluding the risk committee, to be comprised of a majority of non-executive directors. The findings also suggest that although long-serving CEOs have the potential to dominate the board, CEOs should be allowed to serve for longer terms to provide benefit, thus frequent rotation of CEOs is not advisable. (Kader, Adams & Hardwick, 2010)

On average, the audit committees of insurers are 73% independent. Due to the positive effect of audit committee independence on efficiency, insurers should work towards having audit committees that are 100% independent, which is in full compliance with the King Codes. Notably, most of the corporate governance indicators have a negative effect on efficiency, which is not the intended effect. Thus, this is an indication that corporate governance measures should not be enforced on insurers as a 'one size fits all' measure, but rather a focus should be placed on measures that have the intended impact, such as audit committee independence. Insurers may benefit from targeting specific measures to fully comply with to achieve the maximum benefit, rather than attempts to partly comply with as many governance mechanisms as possible.

5.5 Recommendations for Future Studies

Due to the exceedingly low efficiency levels of the long-term South African insurance industry, it would be of great use to investigate the determinants of efficiency in the industry. Other efficiency studies such as Alhassan and Biekpe (2015) have been carried out on the short-term insurance industry in South Africa, however no such study has been performed

over the long-term insurance industry in South Africa. Additionally, the findings show that long-term insurers operate with scale inefficiencies. The study did not, however, delve into the causes of these scale inefficiencies, whether they arose from decreasing returns to scale or increasing returns to scale. This would better inform the insurance industry as to whether scale inefficiencies arise from firms being undersized or oversized. Furthermore, it would be of use to look at the relationship between corporate governance and cost efficiency. As discussed earlier, the South African insurance industry has undergone significant reform in recent years and it would be of interest to determine the effects of the reforms on the efficiency of long-term insurers.

As noted previously, there are limited studies on efficiency and corporate governance in the African insurance market. This study looked at the effect of five notable corporate governance variables on efficiency, and now that it has been determined that corporate governance does affect efficiency, other studies could investigate the relationship between efficiency and other notable corporate governance variables such as CEO duality, number of actuaries on the board of directors, board diligence and financial expertise on the audit committee. Additionally, some assumptions have been made relating to the causes of the negative relationship between non-executive directorship and efficiency. Further research on the direct causes of the negative effect of non-executive directors would add to the current literature and may also be of use to other specialised industries such as banking and finance. Lastly, this study could also be applied to the short-term insurance industry in South Africa.

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